

System Solutions - The Essence of our Experience

Having mastered a great variety of different challenges around chemical processes on both laboratory and pilot scale over the last 20 years, we now funnel our knowledge into standardised system solutions. This will enable you, our customer, to start your **flow chemistry** work on an advanced level.

Are you running a chemical reaction in conventional batch equipment and would you like to evaluate the benefits of a continuous process combined with the advantages of **microreaction technology**?

Our system solutions provide you with tried and tested as well as optimised reactor technology and offer you the complete package. This includes all the necessary components of our modular microreaction system (MMRS) as well as pumps, thermostats, automation system and all other accessories that we found are needed to supply you with the most efficient set-up. In this way you are not only free to improve the yield of your reaction, the purity of your product, the safety of your process in a short time but you may also find new pathways to your products previously inaccessible.

We will guide you through the entire experience **from laboratory** all the way **to production** of several thousand tonnes a year.

Industries

- ✓ Fine and Speciality Chemicals
- ✓ Pharmaceuticals
- ✓ Agrochemicals
- ✓ Food and Beverages
- ✓ Consumer Care

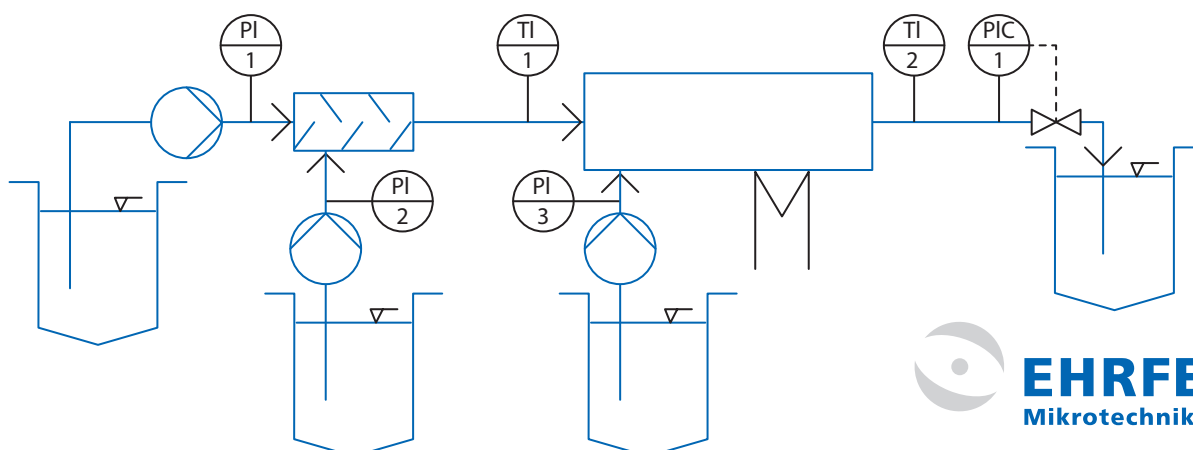
Examples with ready-made system solutions

- ✓ Ethoxilation
- ✓ Peroxides
- ✓ Ozonolysis
- ✓ Lithiation
- ✓ Nitration
- ✓ Individual system solutions on request
- ✓ Organometallic Reactions
- ✓ Radical Polymerisations
- ✓ Precipitations
- ✓ ...

Production & Scale-up Philosophy

The inherent design concept behind our reactors guarantees an **efficient scale-up** of the process. The reactor channel geometry is essentially retained during scale-up with only minimal expansions in the channel cross-sections.

By doing so we can keep the advantages of microreactor technology such as high mixing efficiency, excellent heat exchange and highly adaptive process control. Results from a laboratory campaign are therefore easily transferable to the design of a process scale reactor. The desired throughput is achieved by parallelisation and numbering up of channels within one reactor.



System solution:

Automation

- Hardware
- Software

Peripherals

- Thermostats

Peripherals

- Pumps

Reactor System

- Reactors, Mixers
- Heat Exchangers
- Sensors, Actuators

Service

- Installation
- Training



Technical Specifications	Laboratory Scale	Pilot Scale
Temperature, min.	-60 ... -10 °C	-60 ... -10 °C
Temperature, max.	200 °C	200 ... 250 °C
Pressure max.	35 ... 100 bar	20 ... 56 bar
Reactor volume	1 ... 30 mL	150 ... 470 mL
Typical throughput	2.5 ... 160 mL/min	15 ... 1400 mL/min
Typical retention time	1.5 s ... 10 min	10 s ... 10 min
Media wetted materials	Hastelloy® C22/C276, Alloy 625, Stainless Steel 316, FFKM, PTFE, Sapphire (Viewing Glass)	

